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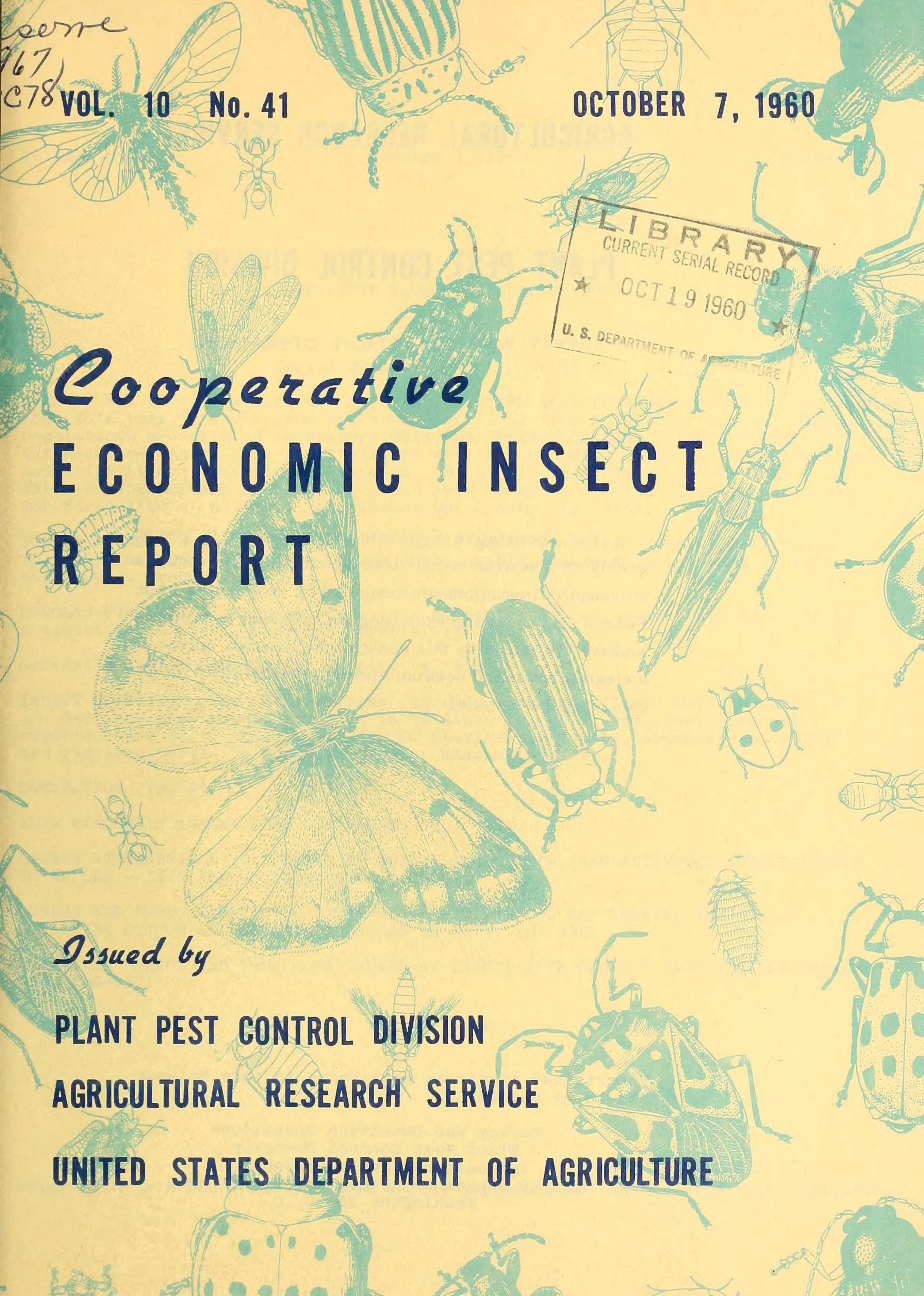

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 10 October 7, 1960 Number 41

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

HESSIAN FLY survey in Missouri reported. SPOTTED ALFALFA APHID reported for first time this year in Washington and found for first time in Malheur County, Oregon; populations building up in western Oklahoma. THREE-CORNERED ALFALFA HOPPER infestations remain high in alfalfa in Arizona; building up in southern Oklahoma; and infestations variable in Arkansas. (p. 944). In Arkansas, additional WHITE-FRINGED BEETLE infestation found near Paragould, Greene County; and found for first time at Blytheville, Mississippi County. (p. 945).

TOMATO PINWORM heavy on tomatoes in Bonita area, San Diego County, California (p. 946); and PEA LEAF MINER caused considerable damage to onion tops at Labish and Wapato, Oregon (p. 947).

DOUGLAS-FIR BEETLE outbreak conditions noted in Montana, especially in parts of Kootenai and Gallatin National Forests. (p. 948).

Current SCREW-WORM situation report. (p. 950).

INSECT DETECTION: New state records reported were face fly in North Dakota (p. 949); and sweetpotato hornworm in Delaware (p. 947). New county records reported were white-fringed beetles in Mississippi County, Arkansas (p. 945); and elm leaf beetle in Hodgeman County, Kansas (p. 948).

CORRECTION (p. 951).

1959 WISCONSIN INSECT LOSS ESTIMATES. (p. 953).

LOSSES ATTRIBUTABLE TO INSECTS IN SOUTH DAKOTA,1959, and ESTIMATED INSECT LOSSES TO APPLES - 1959 (Rhode Island). (p. 954).

LOSSES AND PRODUCTION COSTS ATTRIBUTABLE TO INSECTS AND RELATED ARTHROPODS ATTACKING COTTON AND CORN IN ARKANSAS IN 1959. (p. 955).

ESTIMATED DAMAGE AND CROP LOSS CAUSED BY INSECT/MITE PESTS - 1959 IN CALIFORNIA. (pp. 956-960).

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Reports in this issue are for week ending September 30, unless otherwise indicated.

WEATHER BUREAU 30-DAY OUTLOOK

OCTOBER 1960

The Weather Bureau's 30-day outlook for October calls for temperatures to average below seasonal normals in the area lying between the Appalachians and the Continental Divide. Above normal temperatures are predicted west of the Divide and also along the Atlantic Seaboard. Precipitation is expected to total greater than normal over the eastern third of the Nation but less than normal over the western half. In the intermediate area near normal amounts are anticipated.

Weather forecast given here is based on the official 30-day "Resume and Outlook," published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING OCTOBER 3

Mild, sunny days and cool nights, typical of autumn, was the weather pattern across most of the Nation during the past week. Little or no rain fell in the western half of the country, and amounts in the eastern half were mostly light with heavy amounts limited to the eastern Seaboard States and relatively small areas of the lower Great Plains and lower Mississippi Valley.

Three cold air masses, moving eastward across the northern portion of the country in the course of the week, were responsible for freezes in many sections from the Cascade Mountains to the Atlantic coast; in some areas for the first time this season. Lowest temperatures were recorded in the northern Great Plains and upper Mississippi Valley on the last day of September and in the Great Lakes region and Northeast on the first 2 days of October. On September 30, a low of 19° was reported at Breien, North Dakota, and 30° at Atwood, Kansas; the first freeze of the season in the latter State. On the same date the first light frost of the season in Iowa occurred in lowlands of northern and western areas of the State, with lows of 32° at Inwood and Audubon. On October 1, freezing overspread much of lower Michigan; and 28° at Flint and 27° at Lansing were new records at those locations for so early in the season. On October 2, Saranac Lake, New York, had a low of 21°, Norfolk, Connecticut, 25°, and Canaan Valley, West Virginia, 28°. Scattered frost occurred in central and northern sections of Pennsylvania as well as in susceptible spots of interior New England and in northern New York State. The latter State reported that trees were coloring rapidly. Ninety-degree temperatures were mostly limited to the southwestern desert, but occasionally were reached at other scattered southern stations.

Average temperatures for the week were well above normal in interior areas of the Far West, with departures ranging up to 6° or more. In the North-Central Interior the week was as much as 6° cooler than normal, while weekly averages were near seasonal levels in other areas east of the Rockies.

Heaviest rains in the lower Great Plains occurred early in the week in south central and southeastern portions of Oklahoma and in north central and northeastern Texas. Hugo, Oklahoma, measured 5.43 inches on the 26th. General rains covered the South Central States at the beginning of the period, with heavy amounts in western and central sections of Louisiana and northeastern and southeastern portions of Mississippi. General rains in the Southeast at the beginning of the week gradually spread northeastward to New England during the period, and the entire Atlantic Seaboard had 3 or 4 rainy days. Total rainfall for the week ranged up to 2 inches or more along the south Atlantic coast and up to 8 inches in Georgia, and from about 1/2 to 1 inch along the middle and north Atlantic coasts. Rainfall was very light in most other areas east of the Rockies and many areas are becoming very dry. Akron, Ohio, received less rain during September than in any other month of record. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GRASSHOPPERS - ARIZONA - Medium infestations of *Melanoplus differentialis* damaging Bermuda grass grown for seed at Theba in southwest Maricopa County. (Ariz. Coop. Sur.). OKLAHOMA - Several species of grasshoppers causing heavy damage to margins of some fall-seeded fields of small grain in Major County and alfalfa in Stephens County. Scattered damage noted in Alfalfa County on a variety of newly seeded crops, mainly alfalfa and small grains. (Okla. Coop. Sur.). NEBRASKA - Wheat fields west of Arapahoe, along Republican River Valley, received light to moderate grasshopper damage. One field had to be reseeded out 25 feet from the border. Dominant species *M. bivittatus*, *M. differentialis*, *M. bilituratus*, *M. lakinus* and *Aeoloplides turnbulli*. (Bell).

FALL ARMYWORM (*Laphygma frugiperda*) - TEXAS - Lawns damaged in Midland and Odessa areas and moths continue to lay eggs. (Garner). Activity in eastern and central areas very light, with some egg laying taking place. (Texas Coop. Rpt.). OKLAHOMA - Causing damage to fall-seeded grain, lawns, alfalfa, grass pastures, grain sorghum, etc. (particularly first three) over most of State. Damage generally spotted in most areas. Counties reporting damaging infestations include Alfalfa, Major, Garfield, Blaine, Kingfisher, Canadian, Noble, Osage, Washington, Mayes, Tulsa, McIntosh, Hughes, Pottawatomie and Atoka. (Okla. Coop. Sur.). ALABAMA - Emergence of adults heavy in Auburn area of Lee County; very few larvae observed. (Grimes).

ARMYWORM (*Pseudaletia unipuncta*) - CALIFORNIA - Heavy populations on sorghum in Willows, Glenn County. (Cal. Coop. Rpt.).

CORN EARWORM (*Heliothis zea*) - WYOMING - Larvae found in many fields of corn in Goshen County; counts 18 per 50 ears in one field. Larvae also present on sweet corn in Albany County. (Fullerton). OKLAHOMA - Continues to damage late grain sorghum, particularly in eastern half of State. Only very light infestations noted in alfalfa in southwest, west central, northwest and central areas. (Okla. Coop. Sur.). ARKANSAS - Outbreak in soybeans in east, central and northwest areas declined; however, some fields still infested. Many fields had no infestations. Highest infestation 24 per 100 sweeps. (Ark. Ins. Sur., Sept. 24).

EUROPEAN CORN BORER (*Pyrausta nubilalis*) - TEXAS - Total of 2,164 acres of corn surveyed by Federal and State workers in 15 northeast counties during period of August 22-26, with negative results. (Texas Coop. Rpt.).

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) - ARIZONA - Light to medium infestations present in sorghum and corn in central and southeast areas. Larvae observed boring into base of ear near stalk in few cornfields. This weakened ears and caused them to drop in many cases. (Ariz. Coop. Sur.).

SORGHUM WEBWORM (*Celama sorghiella*) - OKLAHOMA - Continues to damage late grain sorghum throughout eastern half of State. (Okla. Coop. Sur.). TEXAS - Infestation averaged over 100 larvae per head in late grain sorghum in test plots in Burleson County. (Newton). Local heavy infestation on Indiangrass grown for seed in Washington County. (Texas Coop. Rpt.).

CORN LEAF APHID (*Rhopalosiphum maidis*) - CALIFORNIA - Heavy populations in corn in Chino, San Bernardino County. (Cal. Coop. Rpt.).

RUSTY PLUM APHID (*Hysteroneura setariae*) - ARIZONA - Infestations increasing in central area sorghum. (Ariz. Coop. Sur.).

CORN ROOTWORMS (*Diabrotica* spp.) - WYOMING - Adults of *Diabrotica* sp. found in many cornfields in Goshen and Laramie Counties. Adults averaged one per 3 plants. Few adults of *D. undecimpunctata howardi* found on corn and alfalfa in Goshen and Laramie Counties. (Fullerton). NEBRASKA - Counts of *D. undecimpunctata howardi* 8-13 per 10 sweeps in alfalfa in Jefferson, Gage and Pawnee Counties. (Bergman).

HESSIAN FLY (Phytophaga destructor) - MISSOURI - The 1960 hessian fly stubble survey completed. Total of 116 fields surveyed in 24 counties. Average percent infestation by districts is tabulated below. (Munson, Thomas, Wood, Jones).

1960 HESSIAN FLY STUBBLE SURVEY
(Missouri)

District	Average Percent Infestation	
	1959	1960
Northwest	11.9	.6
North central	8.1	9.4
Northeast	11.3	.35
West central	10.5	2.74
Central	8.1	1.2
East central	2.0	1.1
Southwest	7.9	3.5
South central	1.5	
State average	9.1	2.70

A GRASS SCALE - LOUISIANA - Heavy infestation on a St. Augustine grass lawn at Eunice; species probably Antonina graminis. (Spink).

WHITE GRUBS (Phyllophaga spp.) - NEBRASKA - Numerous inquiries received from Lincoln residents regarding damage to lawns in Lancaster County. (Bergman).

SPOTTED ALFALFA APHID (Therioaphis maculata) - WASHINGTON - Recovered on alfalfa in Benton County and at Burbank. First official record this year. (Klostermeyer). OREGON - Found in Big Bend area of Malheur County September 22; first record in the county. (N. Waters). ARIZONA - Infestations remain low in alfalfa statewide. (Ariz. Coop. Sur.). OKLAHOMA - Populations continued to build up in alfalfa in western area of State, with medium to heavy populations noted as far east as Garfield, Blaine and Grady Counties. Light to heavy infestations noted in southwest, west central and northwest areas. Only light infestations present in central area. Newly planted fields in western area should be watched closely for possible damage. (Okla. Coop. Sur.). KANSAS - Counts 140 per sweep in alfalfa in Ellis County; lower leaves yellow. (Harvey). NEBRASKA - Counts 3 per 10 sweeps in Gage County and 9 per 10 sweeps in Jefferson County. (Bergman).

PEA APHID (Macrosiphum pisi) - WASHINGTON - Abundant on last alfalfa cutting at Quincy. (Landis). UTAH - Very numerous in some Salt Lake County alfalfa fields. (Knowlton). WYOMING - Averaged 9 per sweep in alfalfa in Goshen County. (Fullerton). OKLAHOMA - Beginning to appear in isolated fields in Blaine and Garfield Counties. (Okla. Coop. Sur.).

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) - ARIZONA - Infestations remain high in alfalfa statewide. (Ariz. Coop. Sur.). NEW MEXICO - Averaged 3-7 adults per 10 sweeps in Dona Ana County alfalfa. (N. M. Coop. Rpt.). OKLAHOMA - Populations continue to build up in alfalfa throughout southern half of State. Counts range up to 5 per sweep in many fields. Medium numbers (up to 10 per square yard) of nymphs causing spotted damage in some fields in central area. (Okla. Coop. Sur.). ARKANSAS - Infestations vary widely in soybeans in east, central and northwest areas, with counts 3-120 per 100 sweeps; average count 41. Girdling of stems at ground level occurred and some lodging will likely result in fields with higher counts. (Ark. Ins. Sur.).

PLANT BUGS (Adelphocoris spp.) - SOUTH DAKOTA - Immatures abundant in alfalfa in Brookings, Codington and Hamlin Counties. (Mast).

LYGUS BUGS (Lygus spp.) - NEW MEXICO - Light to moderate infestations in alfalfa in southern counties. Averaged 1-3 adults and nymphs in Dona Ana County. (N. M. Coop. Rpt.).

COWPEA CURCULIO (Chalcodermus aeneus) - NORTH CAROLINA - Larvae emerging from field peas in Wake County after picking and placing in dry storage. (Farrier).

MILLIPEDES - NORTH CAROLINA - Undetermined species working in soil around alfalfa in Jackson County; 10 percent of plants affected in one field. (Gibson, Farrier).

BANKS GRASS MITE (Oligonychus pratensis) - WASHINGTON - A damaging infestation present in a Pennlawn red fescue seedfield near Pomeroy, Garfield County. (Harwood, Sept. 23).

ALFALFA CATERPILLAR (Colias philodice eurytheme) - CALIFORNIA - Heavy populations in alfalfa in San Joaquin area, Fresno County. (Cal. Coop. Rpt.). NEW MEXICO - Averaged 1-3 larvae per 10 sweeps in Dona Ana County alfalfa. (N. M. Coop. Rpt.) WYOMING - Larvae averaged 3 per 25 sweeps in Goshen County. (Fullerton). SOUTH DAKOTA - Larvae averaged 6 per 10 sweeps in east central area. (Mast).

VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) - LOUISIANA - Heavy larval infestations found on soybeans at Port Barre. (Spink).

STINK BUGS - ARKANSAS - Numbers vary widely from field to field in soybeans in east, central and northwest areas; counts 0-38 (average 5.7) adults per 100 sweeps. Numbers of nymphs ran higher, 1-64 per 100 sweeps (average 23.1). Species present include Oebalus pugnax, Nezara viridula and at least two species of brown stink bugs, possibly Euschistus servus and others. (Ark. Ins. Sur., Sept. 24).

A HEMIPTERON - LOUISIANA - An undetermined species caused considerable damage to soybeans at Diamond. (Spink).

BEAN LEAF BEETLE (Cerotoma trifurcata) - ARKANSAS - Infestations not as severe in soybeans in east, central and northwest areas as in some years. Counts vary widely from a low of 2 to as high as 610 per 100 sweeps of a 15-inch net. Average count 98. Rather heavy pod feeding occurring, in addition to leaf feeding, in field with high count. (Ark. Ins. Sur., Sept. 24).

WHITE-FRINGED BEETLES (Graphognathus spp.) - ARKANSAS - Additional infestation of about 200 acres found near Paragould in Greene County. Also found for first time near Blytheville, Mississippi County; a new county record. (Ark. Ins. Sur., Sept. 24).

CRICKETS - MINNESOTA - Reports of bowl clipping in swathed flax in west central and northwest districts. This occurred on late-maturing flax. (Minn. Ins. Rpt., Sept. 23). SOUTH DAKOTA - Counts of Acheta sp. down considerably in alfalfa in eastern area. (Mast).

FRUIT INSECTS

GREEN PEACH APHID (Myzus persicae) - WASHINGTON - Fall migrants returning to peach trees at Union Gap. (Landis).

WALNUT HUSK FLY (Rhagoletis completa) - CALIFORNIA - Medium larval infestation in peach fruit in Santa Paula, Ventura County; heavy in peaches in Riverside area, Riverside County; medium in peaches in La Mesa area, San Diego County, and in Yucaipa, San Bernardino County. (Cal. Coop. Rpt.).

PECAN WEEVIL (Curculio caryae) - OKLAHOMA - Damaging pecans in Bryan County; full-grown larvae noted emerging from nuts on pecan trees in Stillwater area. (Okla. Coop. Sur.).

A FALSE SPIDER MITE (Brevipalpus sp.) - NEW MEXICO - Moderate infestations on pecans in Dona Ana County, causing minor damage to foliage. (N. M. Coop. Rpt.).

HICKORY SHUCKWORM (Laspeyresia caryana) - OKLAHOMA - Medium infestation noted on some pecan trees in Payne and Stephens Counties. (Okla. Coop. Sur.).

A STINK BUG (Euthyrhynchus floridanus) - ALABAMA - Causing moderate damage to muscadine grapes in De Kalb County. (Ruffin).

GRAPE LEAF SKELETONIZER (Harrisina americana) - NORTH CAROLINA - Injuring grape foliage in Green County. (Farrier).

TRUCK CROP INSECTS

PACIFIC COAST WIREWORM (Limonius canus) - WASHINGTON - Damaging potato tubers in Columbia Basin Irrigation Project. First report of species causing damage in the project. (Landis, Sept. 23).

TOMATO RUSSET MITE (Aculus lycopersici) - NEW MEXICO - Occasional spotty infestation found in tomato fields in Dona Ana and Luna Counties. (N. M. Coop. Rpt.).

TOMATO PINWORM (Keiferia lycopersicella) - CALIFORNIA - Heavy on tomatoes in Bonita area, San Diego County. (Cal. Coop. Rpt.).

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Egg counts in lettuce decreasing rapidly; controls very effective in preventing larval damage. (Ariz. Coop. Sur.). LOUISIANA - Cabbage 100 percent infested on experiment station at Diamond. (Spink).

CORN EARWORM (Heliothis zea) - ARIZONA - Light infestations of larvae present in some lettuce fields in Cochise County. (Ariz. Coop. Sur.).

CABBAGE APHID (Brevicoryne brassicae) - CALIFORNIA - Heavy populations on cabbage in Linden, San Joaquin County. (Cal. Coop. Rpt.).

TURNIP APHID (Rhopalosiphum pseudobrassicae) - NEW MEXICO - Heavy populations damaging turnips in home gardens at Las Cruces, Dona Ana County. (N. M. Coop. Rpt.).

BEET LEAFHOPPER (Circulifer tenellus) - WASHINGTON - Heaviest spring and early summer infestation on sugar beets and beans in past several years. Much early curly top present on sugar beets; yields of susceptible white varieties of beans run as low as 2 bags per acre. (Landis, Sept. 23).

FLEA BEETLES - CALIFORNIA - Systena taeniata and Chaetocnema ectypa populations heavy on sugar beets in Imperial area, Imperial County. (V. Roth).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - WASHINGTON - All stages damaging sugar beets at Quincy, Moses Lake, Othello, Toppenish and Wapato. (Landis, Sept. 23).

ZEBRA CATERPILLAR (Ceramica picta) - WASHINGTON - Damaging sugar beet foliage near Union Gap. (Telford, Landis; Sept. 23).

WESTERN YELLOW-STRIPED ARMYWORM (Prodenia praefica) - CALIFORNIA - Heavy populations in association with a grasshopper, Melanoplus sp., damaging asparagus in Mt. Signal area, Imperial County. (V. Roth).

PEA LEAF MINER (Liriomyza langei) - OREGON - Caused considerable damage to onion tops in Labish and Wapato area plantings. Development of size of late-planted onions affected in both locations. Det. by K. Frick. (Capizzi).

MELON APHID (Aphis gossypii) - NEW MEXICO - Several melon fields in southern Dona Ana County heavily infested. (N. M. Coop. Rpt.).

HOP APHID (Phorodon humuli) - WASHINGTON - Beginning of flight to woody host plants at Union Gap. (Landis).

SWEETPOTATO HORNWORM (Agrius cingulatus) - DELAWARE - Two adults collected in blacklight trap at Bridgeville on September 26 and 27, one adult each night. This is first record of species in the State. (Burbutis, Mason).

RASPBERRY ROOT BORER (Bembecia marginata) - OREGON - Egg laying observed in a Marion County blackberry field September 23; counts 5-8 per 100 leaves. In a red raspberry field in same county, eggs 3-6 per 100 leaves. (Rosenstiel).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - NEW MEXICO - Survey in southern Dona Ana County shows an apparent late buildup. Infestations in fields which suffered an estimated 75-90 percent infested bolls in 1959 will run less than 10 percent and damage is confined almost entirely to terminal bolls. Infestation much lighter and has appeared at a much later date than it did in 1959. Some fields in area treated this season. (N. M. Coop. Rpt.).

BOLLWORMS (Heliothis spp., et al.) - CALIFORNIA - Medium infestation in cotton in Madera area, Madera County. (Cal. Coop. Rpt.). ARKANSAS - Eggs very common in green cotton; predators apparently holding down larval infestations. (Ark. Ins. Sur., Sept. 24). OKLAHOMA - Light to medium infestations, 2-7 percent, in cotton in southwestern and south central areas. (Okla. Coop. Sur.).

CABBAGE LOOPER (Trichoplusia ni) - CALIFORNIA - Medium infestations on cotton in San Joaquin area, Fresno County, and heavy in Planada area, Merced County. (Cal. Coop. Rpt.). ARKANSAS - Eggs very common in green cotton; predators apparently holding down larval infestations. (Ark. Ins. Sur., Sept. 24). OKLAHOMA - "Ragging" cotton foliage in field in Harmon County. (Okla. Coop. Sur.).

SALT-MARSH CATERPILLAR (Estigmene acrea) - ARIZONA - Infestations continue to increase in central and southwest areas. However, populations appear to be lower than in 1959 and foliage damage is not heavy. (Ariz. Coop. Sur.).

COTTON LEAFWORM (Alabama argillacea) - OKLAHOMA - Defoliating some fields of mature cotton in localized areas of Garvin, Cleveland, McClain and Grady Counties. (Okla. Coop. Sur.).

BOLL WEEVIL (Anthonomus grandis) - OKLAHOMA - Continues to cause heavy damage to unprotected late cotton in central, south central and southwest areas. (Okla. Coop. Sur.).

COTTON APHID (Aphis gossypii) - NEW MEXICO - Heavy populations on cotton in number of fields in Dona Ana County. Lint in these fields covered with honeydew. (N. M. Coop. Rpt.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

WESTERN PINE BEETLE (Dendroctonus brevicomis) - CALIFORNIA - Causing complete kill of 100 ponderosa pines in groups up to 5 trees in a 150-acre stand of saplings and sawtimber in Letts Valley area, Mendocino National Forest, Colusa County. (D. Cramsey).

DOUGLAS-FIR BEETLE (Dendroctonus pseudotsugae) - MONTANA - Aerial surveys show widespread and greatly increased activity. Outbreak conditions noted, especially in parts of Kootenai and Gallatin National Forests. (Denton).

ENGELMANN SPRUCE WEEVIL (Pissodes engelmanni) - MONTANA - Common in Engelmann spruce reproduction. Several reports of injury to ornamental trees. (Denton).

IPS BEETLES (Ips sp.) - MONTANA - Heavy infestation in ponderosa pine has built up in Ft. Howell District of Custer National Forest, following a blowdown in 1958. Mature trees were top-killed and patches of reproduction were destroyed over a 200-acre area. (Denton).

FIR SEED MAGGOTS (Earomyia spp.) - CALIFORNIA - Causing destruction of a large part of the crop of white fir cones in Silver Knob area in the Sierra National Forest. (K. Swain).

A GALL MIDGE (Contarinia sp.) - MONTANA - Poses a threat to important Christmas-tree industry around Eureka and Rexford, Lincoln County. Light spotty infestations showing up in current year's needles of Douglas-fir. (Denton).

GYPSY MOTH (Porthetria dispar) - PENNSYLVANIA - No recoveries of male moths within the State during the 1960 trapping survey. This year's program covered 5,318,104 acres in 16 central and eastern counties. No infestations have been found in the State since 1957. It appears likely that the male pupa found in 1959 near Harrisburg, Perry County, was transported by vehicle from an area outside of the State. (Nichols, Sept. 21).

ORANGE-STRIPED OAKWORM (Anisota senatoria) - ALABAMA - Light damage to oaks in De Kalb County. (Ruffin).

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) - CALIFORNIA - Heavy populations on elms in Riverside, Riverside County. A section of elm limb, 11 inches long by 6 inches in diameter, and 19-inch circumference, had an average of 18.1 emergence holes per square inch. An estimated 3,762 adults emerged from this section. Heavy population of scutacarid mites found on emerging beetles in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (Galerucella xanthomelaena) - KANSAS - Larvae from Hodgeman County identified as this species. This is a new county record. (DePew). Surveys were made during week of September 19-23 in Coffey, Franklin, Allen, Bourbon, Cherokee, Crawford, Labette, Montgomery, Neosho, Wilson and Woodson Counties. Evidence of damage or various stages of the beetle were found in all cases. Severe defoliation of Chinese elms and some American elms in Bourbon County and fairly general light damage in Montgomery County. (Calkins). OKLAHOMA - Damage continues on unprotected elms throughout most of State. (Okla. Coop. Sur.).

TWIG GIRDLER (Oncideres cingulata) - OKLAHOMA - Damaging a variety of shade trees (primarily elms) in Garfield, Blaine, Canadian, Stephens, Noble, Mayes and Hughes Counties. (Okla. Coop. Sur.).

RED-HEADED ASH BORER (Neoclytus acuminatus) - TEXAS - Local heavy infestation on several ornamentals in Austin, Travis County. (Cook).

A SPHINGID (Smerinthus cerisyi) - OREGON - Larvae damaging willow at several locations in Salem. (Capizzi).

PEAR-SLUG (*Caliroa cerasi*) - MARYLAND - Heavy on ornamental *Prunus* sp. at Brookeville, Montgomery County. (U. Md., Ent. Dept.).

A MITE (*Pentamerismus taxi*) - CALIFORNIA - Heavy populations occurring on yew trees in Oroville, Butte County. (Cal. Coop. Rpt.).

AMERICAN PLUM BORER (*Euzophera semifuneralis*) - CALIFORNIA - Heavy populations on maples in San Rafael, Marin County. (Cal. Coop. Rpt.).

A SPITTLEBUG (*Tomaspis* sp.) - NORTH CAROLINA - Infesting holly in Cumberland County (Monroe, Farrier).

APHIDS - CALIFORNIA - *Cinara* sp. heavy on juniper in San Diego, San Diego County. (Cal. Coop. Rpt.). MARYLAND - *Lachnus salignus* light to moderate on willow at several localities in Prince Georges County. (U. Md., Ent. Dept.). OKLAHOMA - Several species of aphids common on a variety of ornamental plants including oak, maple and crapemyrtle over most of State. (Okla. Coop. Sur.).

SCALE INSECTS - CALIFORNIA - *Chrysomphalus aonidum* on rubber plants in a nursery in Visalia, Tulare County. (Cal. Coop. Rpt.). MARYLAND - *Unaspis euonymi* heavy on euonymus at Denton, Caroline County. *C. obscurus* infesting scarlet oak at Baltimore. (U. Md., Ent. Dept., Sept. 22, 23).

INSECTS AFFECTING MAN AND ANIMALS

HORN FLY (*Siphona irritans*) - NEBRASKA - About 60-64 per animal in herd in Pawnee County while Otoe County herd averaged 250 flies per animal. (Bergman). OKLAHOMA - Populations very light in Stillwater area where counts per animal averaged 25 on dairy cows and 100 on bulls. Less than 50 per animal on beef cattle checked in central area. Continued to cause concern in the northeast, east central, southeast and south central areas. (Okla. Coop. Sur.).

STABLE FLY (*Stomoxys calcitrans*) - NEBRASKA - An average of 28 per animal on cattle in Pawnee County and 32 per animal on cattle in Otoe County. (Bergman).

FACE FLY (*Musca autumnalis*) - NORTH DAKOTA - Collected September 14 on Shorthorn cattle by W. J. Brandvik in a pasture near Fargo, Cass County. First report for State. Det. C. W. Sabrosky. (N. D. Ins. Sur.) NEBRASKA - Counts of 8-12 per animal in a herd in Pawnee County and averaged 6-8 per animal in an Otoe County herd. (Bergman).

FLIES - UTAH - Blow flies troublesome about a fishing area in Logan Canyon. (Knowlton). OKLAHOMA - Light oviposition by *Gasterophilus* sp. on horses in central area; egg laying common on horses in Delaware County. (Okla. Coop. Sur.). ALABAMA - Heavy infestations of an undetermined green bottle fly in Lee County. Apparently attracted to decaying vegetation. (Ruffin).

TABANIDS - OKLAHOMA - Several species of horse flies very low in Payne-Noble County area. Infestations continued in favorable areas in the north central, east central, southeast and south central areas. (Okla. Coop. Sur.).

PIGEON FLY (*Pseudolynchia canariensis*) - CALIFORNIA - Medium infestation in a pigeon loft in Riverside, Riverside County. (Cal. Coop. Rpt.).

A RODENT BOT (*Cuterebra polita*) - UTAH - Collected in upper Willard Basin, summit of Wellsville Mountains, July 24. Det. by C. W. Sabrosky. (Bohart, Knowlton).

MOSQUITOES - NORTH CAROLINA - Adults of *Anopheles bradleyi*, *Psorophora howardii*, *Aedes atlanticus* and *A. taeniorhynchus* biting in Pamlico County. (Ashton). WISCONSIN - Mosquitoes have been numerous in many sections following recent rains. (Wis. Coop. Sur.).

SCREW-WORM (*Callitroga hominivorax*) - LOUISIANA - Thirteen new infestations reported from the following parishes: De Soto 1, Ouachita 1, Richland 6, and Franklin 5. One of the reports from Franklin Parish included an infested dog. (Spink). OKLAHOMA - Reports of infestations in livestock continued from south central, southeast and east central areas. (Okla. Coop. Sur.).

Current Screw-worm Situation Report - Week Ending October 2, 1960

State	Cumulative Totals - 1960		Counties or Parishes
	Cases	Premises	
Alabama	1	1	Geneva
Arkansas	21	18	Chicot Ashley
Louisiana	54	47	Richland Franklin De Soto Madison Red River Rapides Ouachita East Carroll
Mississippi	24	15	Issaquena Sharkey Washington Sunflower
Totals	100	81	15

Screw-worm Cases Intercepted at Inspection Stations: 1960 - 22 to date.

SADDLEBACK CATERPILLAR (*Sibene stimulea*) - NORTH CAROLINA - Feeding on pears and cannas and stung man in Wake County. Carried into house on deciduous foliage used in decorations in the county. (Flake, Farrier). More reports than in any previous year since records available in State. (Farrier).

PUSS CATERPILLAR (*Megalopyge opercularis*) - NORTH CAROLINA - Numerous in Durham County and caused hospitalization of one man. (Ashton). VIRGINIA - Injured woman in Williamsburg, James City County. (Bryant, Tarpley; Sept. 16).

A YELLOW JACKET (*Vespula pensylvanica*) - CALIFORNIA - Heavy populations in barbecue area in Castle Rock Park during the month. Annoying picnickers in Walnut Creek, Contra Costa County. (Cal. Coop. Rpt.).

BLACK WIDOW SPIDER (*Latrodectus mactans*) - UTAH - A problem and has entered several houses in Roosevelt, Duchesne County. (Knowlton).

STORED-PRODUCT INSECTS

RED-LEGGED HAM BEETLE (*Necrobia rufipes*) - WASHINGTON - Infesting hides received by a processing company at Bellingham. (James).

CADELLE (*Tenebroides mauritanicus*) - MARYLAND - Adults and larvae abundant on grain in storage at a plant in Worcester County. (U. Md., Ent. Dept.).

Stored-Product Insects in Texas - Medium to heavy infestations of RED FLOUR BEETLE (*Tribolium castaneum*), a BEETLE (*Cynaeus angustus*) and INDIAN MEAL MOTH (*Plodia interpunctella*) found damaging stored grain and other feedstuff in Nolan County. (Wilde, Sept. 23).

BENEFICIAL INSECTS

A PARASITE (*Lydella grisescens*) - WISCONSIN - Parasitism of overwintering forms of *Pyrausta nubilalis* averaged 8.2 percent for the State. Heaviest parasitism 15.8 percent in south central district, 20.9 percent in southwest district and 20.4 percent in west central district. (Wis. Coop. Sur.).

LADY BEETLES - CALIFORNIA - *Psyllobora taedata* and *Chilocorus stigma* populations medium on squash in San Diego, San Diego County. (Cal. Coop. Rpt.). WYOMING - Adults of *Hippodamia* sp. averaged 4 per corn plant and 8 per 25 sweeps in alfalfa in Goshen County. (Fullerton).

FLOWER BUGS (*Orius* spp.) - ARKANSAS - Populations of *O. insidiosus* increased in green cotton since treatments discontinued; also numerous in soybeans. (Ark. Ins. Sur., Sept. 24). WYOMING - Adults of *Orius* sp. averaged 8 per corn plant and 4 per 25 sweeps in alfalfa in Goshen County. (Fullerton).

A BIG-EYED BUG (*Geocoris punctipes*) - ARKANSAS - Populations increased in green cotton since treatments have been discontinued. Nymphs numerous in soybeans. (Ark. Ins. Sur., Sept. 24).

NABIDS (*Nabis* spp.) - OKLAHOMA - Common, up to 0.8 per sweep, in alfalfa in central area. (Okla. Coop. Sur.). WYOMING - Adults averaged 8 per 25 sweeps in alfalfa in Goshen County. (Fullerton).

LACEWINGS (*Chrysopa* spp.) - OKLAHOMA - Common, up to 1 per sweep, in alfalfa in central area. Eggs common on ornamental plants infested with aphids in central and north central areas. Very few adults and larvae noted, however. (Okla. Coop. Sur.).

MISCELLANEOUS INSECTS

BOXELDER BUG (*Leptocoris trivittatus*) - UTAH - Extremely annoying about, and entering some homes and schoolrooms at Logan, Salt Lake City, Murray and Ogden in northern area. (Knowlton). MINNESOTA - Numerous reports from Twin City area of invasions into homes; populations will apparently be heavy this fall. (Minn. Ins. Rpt., Sept. 23). NORTH CAROLINA - Invading a house in Wake County. (Jones,Farrier).

FIELD CRICKET (*Acheta* sp.) - OKLAHOMA - Entering homes in Delaware County; light numbers noted during evenings in display windows of stores in central area. (Okla. Coop. Sur.). TEXAS - Heavy numbers around lights at night and entering houses, causing concern to residents in College Station and Bryan area. (Hawkins).

NOCTUIDS - CONNECTICUT - *Amphipyra pyramidoides* adults collected in kitchens in Greenwich and New Haven; in shrubbery in Trumbull; also reported by telephone during past month. (Johnson, Sept. 28). UTAH - *Rhodophora florida* appeared in blacklight trap collections at Ogden during July. Det. by E. L. Todd. This species is uncommon in the State. (Knowlton).

A WEEVIL (*Trachyphloeus bifoveolatus*) - OREGON - Has been of concern to homeowners in Coos Bay area during late September. (Every).

BOOKLICE - SOUTH DAKOTA - Reported a problem in a hatchery in Watertown, Codington County; species believed to be *Liposcelis divinatoria*. (Mast).

A DAMPWOOD TERMITE (*Zootermopsis angusticollis*) - OREGON - Flights observed frequently in mid-Willamette Valley during past 4 weeks. (Ritcher).

CORRECTION

CEIR 10(40):939 - 1959 Colorado Insect Loss Estimates - Under Acres Reported, change Rangeland - Farm and Ranch figure to 899 cwt. and Alfalfa figure to 1,648 ton.

LIGHT TRAP COLLECTIONS

	Pseud.	Laphyg.	Agrot.	Perid.	Protoparce		Helio.	Prod.
	unip.	frug.	ips.	saucia	sexta	quinq.	zea	ornith.
ALABAMA								
Auburn 9/30	87	4				1	11	
ARIZONA								
Mesa 9/19-25				1			137	821
ARKANSAS								
Hope 9/22-28	44		6	2			441	
Morrilton 9/22-28	66		29				730	
DELAWARE								
Bridgeville 9/21-27					16		58	
ILLINOIS								
Urbana 9/23-29	53	58	36	5	7		355	21
INDIANA (Counties)								
Tippecanoe 9/22-28	4		1				52	5
Vanderburgh 9/14-17, 19,21	14				5	3	100	8
KANSAS								
Garden City 9/13-16, 19-23,26	208	75	72	40	1	3	259	
Hays 9/16,20,22,24,26	26	3	11	3			130	3
Manhattan 9/17-28	22	94	11	25	1	1	496	15
Wathena 9/13-21	71	17	21	13	5	21	303	6
LOUISIANA								
Baton Rouge 9/23-29	40	715	29	4			77	62
MISSISSIPPI								
*Stoneville 9/23-29	558	1,532	73	4	63		2,025	798
NEBRASKA								
Alliance 9/10-21	124		8	15		1	19	
Kearney 9/19-23	98	18	36	13	7	4	660	3
Lincoln 9/23-30	9			3			64	
North Platte 9/22-27	481	15	54	18			210	
SOUTH CAROLINA								
Clemson 9/24-30	93	385	15	4	3	2	94	427
TENNESSEE (Counties)								
Madison 9/20-26	85	78	14	10	7	14	300	176
Maury 9/20-26	40	10	12	10	17	20	192	28
Robertson 9/20-26	60	12	4	8	5	7	220	88
Cumberland 9/20-26	165	22	8	4	10	2	210	45
Greene 9/20-26	20	10	35	12	3	7	180	48
Johnson 9/20-26	232	110	72	30	1	1	300	250
TEXAS								
Waco 9/24-30	544			173			1,442	277
WYOMING								
Centennial 9/1-21	6		3	4			15	

Additional Collections

ARIZONA - (Mesa 9/19-25); Spodoptera exigua - 1,232.

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* Two traps - Stoneville

1959 WISCONSIN INSECT LOSS ESTIMATES

CROP	FROM CROP OR LIVESTOCK REPORTING SERVICE		PEST OR PEST COMPLEX (see legend)	M ACRES TREATED	% REDUCTION YIELD/A FROM POTENTIAL	TOTAL COST OF CONTROL PRACTICE PER ACRE	TOTAL COST ALL ACRES TREATED M	ESTIMATED GAIN FROM TREATMENT M$	YIELD LOSS PLUS CONTROL COST M$
	M ACRES PLANTED	M YIELD							
Corn	2,766	179,790 bu.	Sub.; et al.	100	1	2.00	200	704.15	686.85 1,867.42
Sweet corn	102	401 T.	Ecb, Ce	12.09	4	3.25	39.29	1/	72
Peas	93	214,000 lbs.	Pa	6.5	5	3.50	22.77	74.82	55.3
Potatoes	45	6,570 cwt.	All	42.75	5	20.00	855	3,226.94	1,535.32
Apples	1.34	1,340 bu.	All	1.34	7	110.00	147.4	2,158.07	320.93
Cherries	10	11 T.	All	10	2	80.00	800	432	828
Forage	3,944	9,707 T.	All	------	Trace	------	------	--------	15
Small grain	2,713	132,370 bu.	G	20	5	1.25	25	4.34	54.34
Cabbage	5.7	1,425 cwt. (fresh) 33 T. (kraut)	All	5.45	10	12.00	65.4	1,191.85	205.09
Onions	2.8	700 cwt.	All	2.1	1	8.00	16.8	32.55	29.14
Carrots	1.7	544 cwt.	Lh	.85	2	9.00	7.65	2.72	14.56
Cucumbers	16.1	1,932 bu.	All	4	1	3.00	12	39.84	17.76
Cranberries	4.2	440 bbl.	All	COMPLETE LOSS					
Soybeans	95	1,758 bu.	All	------	Trace	------	------	--------	2

FOOTNOTE

1/ Impossible to figure value of saving of trim time or less risk of insect fragments in canned product.

NOTE: M = 1,000

CEIR 10(41):10-7-60

LEGEND

Ce = Corn earworm (*Heliothis zea*)

Ecb = European corn borer (*Pyrausta nubilalis*)

G = Greenbug (*Toxoptera graminum*)

Lh = Leafhoppers

Sub.; et al. = Subterranean insects and others

Pa = Pea aphid (*Macrosiphum pisi*)

LOSSES ATTRIBUTABLE TO INSECTS

SOUTH DAKOTA 1959

PEST	CROPS AFFECTED	ACREAGE TREATED	ESTIMATED SAVINGS FROM SPRAYING	ESTIMATED LOSSES
Grasshopper	All cereal and forage	231,940	$1,756,150	$1,821,250
Greenbugs	Small grains	22,535	Not determined	$ 569,000
Corn rootworms	Corn	122,715	$1,200,000	$ 380,000
European corn borer	Corn	113,150	$ 33,945	$1,239,000

RHODE ISLAND

ESTIMATED INSECT LOSSES TO APPLES - 1959

THOUSAND BUSHELS PRODUCED	NUMBER OF SPRAYS	COST PER BUSHEL FOR INSECT CONTROL			TOTAL PROBABLE COST PER STATE FOR ALL APPLES GROWN	PERCENT OF APPLES INJURED BY INSECTS IN SPRAYED ORCHARDS	ESTIMATED VALUE OF APPLES LOST BY INSECT INJURY	ESTIMATED LOSS BY INSECTS PLUS CONTROL COST
		MATERIALS	APPLICATION	TOTAL				
160	13-15	$0.20	$0.12	$0.32	$51,000	10	$16,000	$67,200

CEIR 10(41):10-7-60

LOSSES AND PRODUCTION COSTS ATTRIBUTABLE TO INSECTS AND RELATED ARTHROPODS

ATTACKING COTTON AND CORN IN ARKANSAS IN 1959

CROP	INSECT(S)	TOTAL ACREAGE	TOTAL PRODUCTION	UNIT VALUE	TOTAL VALUE	% ESTIMATED LOSS	UNIT LOSS	PRESENT MARKET VALUE; $ LOSS	ACREAGE TREATED	TREATMENT COST	ESTIMATED SAVING
		1000 Acres	1000		$1000		1000	$1000	1000	$1000	$1000
Cotton	Boll weevil, bollworm, aphids, mites	1,412	1,618 bales	$181	292,858	4	67 bales	12,127	1,100	11,660	58,400
Corn	European corn borer, southwestern corn borer, fall armyworm, corn earworm, sugarcane beetle	420	13,860 bu.	$ 1.25	17,325	18	3,042.44 bu.	3,803.05	6	12	40

CEIR 10(41):10-7-60

STATE OF CALIFORNIA
DEPARTMENT OF AGRICULTURE
WILLIAM E. WARNE, DIRECTOR
SACRAMENTO

March 4, 1960

E-82-2

COPY

TO: All County Agricultural Commissioners

SUBJECT: Estimated Damage and Crop Loss Caused by Insect/Mite Pests - 1959

This cooperative economic insect report of estimated damage and crop loss attributed to insect/mite pests is summarized from special reports submitted by Agricultural Commissioners in connection with their list of the 10 most important insect/mite pests for 1959. Such reports were received from 53 counties. The county compilation of this information involved a great deal of work, and yet the data must of necessity be considered an estimate. Many of the county reports submitted were most complete, giving estimated crop value, percentage loss caused by insects, and cost of treatment. Other reports were less complete, entailing considerable reinterpretation of the data presented.

Due to the diversity of crops and geographical differences encountered within the State, damage and loss figures are reported on 112 insect/mite species. Losses from minor pest groups were not reported and are not included in these statistics.

Animal pests are included in the estimate this year but are not complete as they represent only a few counties.

This year an estimate of structural and commercial pest control is included. Figures for this category include rodent control costs. Termites were the major pest. Moths, roaches, carpet beetles, wood borers and ant control costs are included in the collective total.

Due to the diversity of crops attacked by a single species of insects, overlapping treatments and other effects the totals of the assessable yield loss and control costs do not always equal the estimated over-all loss total. For a more accurate representation of statewide percent loss, the lowest-highest value is given rather than an average.

In cases where a damage-loss figure was assigned to a definite species it is so credited, whereas such assignments for broader aphid and mite groups are reported compositely. The attached table presents the breakdown of assigned damage-loss value.

Ronald M. Hawthorne
Economic Entomologist

Robert W. Harper, Chief
Bureau of Entomology

CROP LOSS ESTIMATE REPORT FOR CALIFORNIA - 1959

Insects	Assessable Yield Loss ($)	Control Cost ($)	% Loss of Crop Value	Estimated Over-all Loss ($)
Mites (non-specific)	5,995,273	3,982,984	.014-13.	11,479,683
Citrus red mite (*Panonychus citri*)	2,978,732	2,625,859	2.5-5.	5,794,591
Citrus rust mite (*Phyllocoptruta oleivora*)	120,000	63,000	2.	183,000
Clover mite (*Bryobia praetiosa*)	98,000	195,000	1.	263,000
Cyclamen mite (*Steneotarsonemus pallidus*)	100,000	45,000	2.	145,000
Date mite (*Oligonychus pratensis*)	-	-	-	-
European red mite (*Panonychus ulmi*)	183,503	888,175	.25-2.	1,112,278
Grape erineum mite (*Eriophyes vitis*)	100,000	-	5.	100,000
Pacific spider mite (*Tetranychus pacificus*)	15,000	1,000	4.	16,000
Pear leaf blister mite (*Eriophyes pyri*)	9,336	165,330	.10-1.2	194,322
Tomato russet mite (*Aculus lycopersici*)	-	-	-	-
Two-spotted spider mite (*Tetranychus telarius*)	1,392,838	8,736,685	.25-4.	10,129,523
Mites All - Total	10,992,682	16,703,033		29,417,397
European earwig (*Forficula auricularia*)	21,500	8,300	3.-10.	30,800
Grasshoppers	40,939	33,983	.001-9.	86,010
A field cricket (*Acheta* sp.)	600,000	100,000	1.	700,000
Thrips (non-specific)	1,011,193	995,661	.003-10.	2,009,856
Bean thrips (*Hercothrips fasciatus*)	32,000	-	-	32,000
Citrus thrips (*Scirtothrips citri*)	3,002,993	301,580	2.-5.	3,314,573
Onion thrips (*Thrips tabaci*)	131,525	21,470	1.-1.7	152,996
Thrips All - Total	4,177,711	1,318,711		5,509,425
Leafhoppers (non-specific)	95,968	374,140	.004-2.5	442,009
Six-spotted leafhopper (*Macrosteles fascifrons*)	41,283	-	1.5	41,283
A grape leafhopper (*Erythroneura variabilis*)	967,100	1,480,556	.5-2.2	2,447,656
Leafhoppers All - Total	1,104,351	1,854,696		2,930,948
Pear psylla (*Psylla pyricola*)	19,683	318,600	.5-4.	338,283
Aphids (non-specific)	5,254,475	3,355,898	.001-10.	7,579,077
Apple aphid (*Aphis pomi*)	10,000	120,000	.33	130,000
An ash aphid (*Prociphilus fraxini-dipetalae*)	-	-	-	-
Cabbage aphid (*Brevicoryne brassicae*)	273,150	283,500	2.-10.	556,650
A celery aphid (*Anuraphis apiifolia*)	50,000	30,000	2.	80,000
Green peach aphid (*Myzus persicae*)	207,403	124,656	.1-5.	332,059
A lettuce root aphid (*Pemphigus bursarius*)	120,000	5,000	.5	150,000
Melon aphid (*Aphis gossypii*)	783,846	47,516	.1-2.	831,362
Pea aphid (*Macrosiphum pisi*)	10,000	-	5.	10,000
Potato aphid (*Macrosiphum euphorbiae*)	-	-	-	-

Aphids continued on page 958

Insects	Assessable Yield Loss ($)	Control Cost ($)	% Loss of Crop Value	Estimated Over-all Loss ($)
Rosy apple aphid (*Anuraphis roseus*)	145,200	166,000	3.-5.	311,200
Spotted alfalfa aphid (*Therioaphis maculata*)	2,184,158	1,222,200	.04-8.	3,615,458
Sugar-beet root aphid (*Pemphigus betae*)	60,000	1,000	.5	45,000
Walnut aphid (*Chromaphis juglandicola*)	37,200	192,700	1.-5.2	189,900
Woolly apple aphid (*Eriosoma lanigerum*)	279	1,475	1.	1,754
Aphids All - Total	9,135,711	5,549,945		13,832,460
Mealybug (non-specific)	3,336	55,330	.10	58,666
Citrus mealybug (*Pseudococcus citri*)	75,000	45,000	.15	120,000
Mealybug All - Total	78,336	100,330		178,666
Scales (non-specific)	805,000	545,000	3.-8.	1,459,200
Black scale (*Saissetia oleae*)	905,804	741,902	.25-3.	1,660,006
California red scale (*Aonidiella aurantii*)	1,380,060	1,449,041	1.5-7.6	2,990,102
European fruit lecanium (*Lecanium corni*)	2,000	81,000	.5	83,000
Greedy scale (*Aspidiotus camelliae*)	3,000	5,000	1.	8,000
Olive scale (*Parlatoria oleae*)	600,521	569,616	.016-5.	1,170,137
San Jose scale (*Aspidiotus perniciosus*)	1,456,542	1,084,708	.006-5.	2,509,254
Brown soft scale (*Coccus hesperidum*)	2,000	6,000	.5	8,000
Yellow scale (*Aonidiella citrina*)	1,799,096	600,000	3.	2,399,096
Scales All - Total	6,954,023	5,082,267		12,286,795
Whiteflies	150,000	7,755	-	157,755
Stink bugs	3,543,336	215,330	.10-13.	3,758,666
Lygus bugs (*Lygus* spp.)	6,541,340	8,189,664	.007-12.	14,920,543
Alfalfa weevil (*Hypera postica*)	104,920	6,120	.002-10.	111,040
•A flea beetle (*Systena taeniata*)	56,609	44,650	2.	101,259
Borers	50,000	25,000	3.	75,000
A carabid (*Harpalus pennsylvanicus*)	49,000	9,000	2.	47,000
Clover leaf weevil (*Hypera punctata*)	24,480	1,500	1.	25,980
Clover seed weevil (*Miccotrogus picirostris*)	12,000	2,400	12.	14,400
A cucumber beetle (*Diabrotica* sp.)	418,602	66,250	3.	484,852
Elm leaf beetle (*Galerucella xanthomelaena*)	5,000	300	10.	5,300
Fuller rose beetle (*Pantomorus godmani*)	49,000	900	2.	47,000

Continued on page 959

Insects	Assessable Yield Loss ($)	Control Cost ($)	% Loss of Crop Value	Estimated Over-all Loss ($)
Granary weevil (Sitophilus granarius)	-	15,680	-	-
Hoplia sp.	49,000	900	2.	47,000
A June beetle (Cyclocephala pasadenae)	49,000	900	2.	47,000
Western peach tree borer (Sanninoidea exitiosa graefi)	70,000	100,000	2.	205,590
Saw-toothed grain beetle (Oryzaephilus surinamensis)	500	1,500	.02	2,000
Shot-hole borer (Scolytus rugulosus)	10,000	-	1.	10,000
Wireworms	300,000	140,000	.75	490,000
A sod fly (Metoponia rubriceps)	-	-	-	-
Cabbage maggot (Hylemya brassicae)	18,000	11,110	1.	29,100
Leaf miners (non-specific)	922,929	237,615	.1-12.	1,178,544
A rice leaf miner (Hydrellia griseola)	454,000	80,040	1.	534,200
A serpentine leaf miner (Liriomyza sp.)	380,583	116,000	.3-21.	496,583
Leaf miners All - Total	1,757,512	433,655		2,209,327
A native fruit fly (Eutreta pacifica)	-	-	-	-
Onion maggot (Hylemya antiqua)	2,580	1,000	1.	3,580
A vinegar fly (Drosophila melanogaster)	597,716	191,540	1.-12.	789,256
Walnut husk fly (Rhagoletis completa)	180,000	155,000	5.-7.	335,000
Alfalfa caterpillar (Colias philodice eurytheme)	533,000	373,000	6.	906,000
Alfalfa looper (Autographa californica)	125,000	166,600	2.5	291,660
Armyworm (Pseudaletia unipuncta)	149,600	81,121	1.-2.	230,721
Artichoke plume moth (Platyptilia carduidactyla)	469,800	143,500	10.-40.	945,300
Beet armyworm (Spodoptera exigua)	684,000	265,000	.3-2.	949,000
Cabbage looper (Trichoplusia ni)	6,268,188	2,709,315	.028-17.	9,195,663
Codling moth (Carpocapsa pomonella)	705,404	1,668,816	.5-25.	2,428,450
Corn earworm (Heliothis zea)	8,685,010	5,568,021	.020-12.	14,982,428

Continued on page 960

Insects	Assessable Yield Loss ($)	Control Cost ($)	% Loss of Crop Value	Estimated Over-all Loss ($)
Cotton leaf perforator (*Bucculatrix thurberiella*)	3,566,549	569,153	6.-12.	4,135,702
Cutworms	900,751	895,147	.001-5.	1,851,418
Grape leaf folder (*Desmia funeralis*)	501,747	194,960	.012-5.	696,707
Imported cabbageworm (*Pieris rapae*)	75,000	95,000	1.-2.5	169,000
Lawn moths	-	-	-	-
Moths (non-specific)	500,000	250,000	7.	750,000
Navel orangeworm (*Paramyelois transitella*)	250,743	21,500	1.-5.	272,243
Omnivorous leaf tier (*Cnephasia longana*)	-	-	-	1,500
Orange tortrix (*Argyrotaenia citrana*)	234,000	315,000	.01-3.	550,000
Peach twig borer (*Anarsia lineatella*)	7,289,057	1,024,059	.007-8.	4,378,516
Potato tuberworm (*Gnorimoschema operculella*)	881,400	816,975	.028-27.	1,965,726
Red-humped caterpillar (*Schizura concinna*)	120	350	2.	470
Salt-marsh caterpillar (*Estigmene acrea*)	1,693,104	418,000	2.-31.	2,111,104
Southern cabbageworm (*Pieris protodice*)	63,000	83,000	25.	145,000
A tent caterpillar (*Malacosoma constrictum*)	9,400	100,000	.01	110,400
Tomato hornworm (*Protoparce quinquemaculata*)	28,604	105,050	1.-10.	103,654
Tomato pinworm (*Keiferia lycopersicella*)	800,000	173,600	4.	973,600
Clover seed chalcid (*Bruchophagus gibbus*)	236,700	137,000	5.	373,700
Tadpole shrimp (*Apus oryzaphagus*)	48,900	87,300	1.	136,200
Animal Pests				
Lice (Haematopinidae)	21,600	1,800	.075	23,400
Bird lice (Menoponidae and Philopteridae)	1,200	900	.45	2,100
Cattle ticks (*Ixodes* spp. and *Dermacentor* sp.)	40,000	2,000	-	42,000
Horn fly (*Siphona irritans*)	133,000	10,000	.018-.165	143,000
Horse flies (*Tabanus* spp.)	1,500	2,500	.083	4,000
Common cattle grub (*Hypoderma lineatum*)	61,500	6,500	.083	68,000
Black blow fly (*Phormia regina*)	1,000	800	.8	1,800
Animal Pests - Total	259,800	24,500		284,300
Agricultural Pests - Total				138,165,894
Structural Pest Control				
Termites, carpenter bees, wood borers, carpenter ants, roaches, carpet beetles, moths, ants and rodents				39,808,250
Structural Pest Control - Total				39,808,250
GRAND TOTAL				177,974,144

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